

CONTINUATION OF CERTIFICATION HANDBOOK FOR U.S. NAVY DIVING SYSTEMS



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REVISION 1**

FOREWORD

This handbook is intended to serve as a guide to be used in conjunction with NAVSEA SS521-AA-MAN-010, U.S. NAVY DIVING AND MANNED HYPERBARIC SYSTEMS SAFETY CERTIFICATION MANUAL. Whether you are a Second Class Diver with only limited experience or a seasoned Master Diver, this handbook should prove useful in maintaining system certification already granted, i.e., a system that is presently certified, but is nearing the end of certification tenure.

Continuation of certification does not need to be a complicated process. Frequent communication with our certification division at (703) 607-1570 or AUTOVON 327-1570 is recommended. By using a systematic approach and reviewing documents and equipment as you go through the Pre-Survey Outline Booklet (PSOB), continuation of certification can be accomplished with a minimum of difficulty.

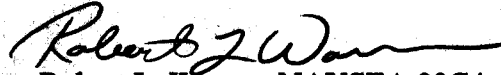

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System Certification Authority

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LIST OF ENCLOSURES

- (1) Pre-Survey Outline Booklet for U.S. Navy Surface Supported Diving Systems
- (2) Pre-Survey Outline Booklet for U.S. Navy Recompression Chamber Systems
- (3) System Certification Survey Checklist
- (4) Typical Metal Test Tags

STANDARD NAVY SYNTAX SUMMARY

This manual utilizes standard Navy syntax regarding permissive, advisory and mandatory language. This manual's intended word meanings are as follows:

“Shall” has been used only when application of a procedure is mandatory.

“Should” has been used only when application of a procedure is recommended.

“May” and “need not” have been used only when application of a procedure is discretionary.

“Will” has been used only to indicate futurity; never to indicate any degree of requirement for application of a procedure.

SECTION I - PLANNING THE ON-SITE SURVEY

1-1 Preparing for the On-Site Survey

Before scheduling the on-site survey, several items should be considered. A brief description of these items include the following:

- a. The survey should be scheduled at a time when no other major evolutions are planned, such as OPPE's, DORI's, Sea Trials, etc. Full participation by diving locker personnel is essential for the on-site survey to be successful.
- b. It will be necessary for the surveyor to meet with diving locker personnel who are responsible for the day-to-day operation and maintenance of the system. This will include personnel such as the Supply Petty Officer, QA Petty Officer, and Diving Locker 3M Coordinator as well as persons who actually perform the maintenance. It is important that these persons be available so that the survey can be finished in the time allotted.
- c. During the survey, the system must operate as designed. For this reason, it is a good idea to operate the entire system prior to the scheduled start date of the survey. This will allow time to correct any problems that may arise. The time allotted for the survey cannot be extended to allow time for repairs to the system.
- d. If the OPs/EPs have been revised since the last survey, ensure that you have the letter from NAVSEA (Code 00C3) approving the revision.
- e. Check to ensure that all reentry control packages are closed out. Continuation of certification can not be granted if any RECs are open.
- f. Verify all system components requiring calibration, air samples, hydro's or any testing are completed and documented prior to the on-site survey.

1-2 Requesting the On-Site Survey

The on-site survey should be conducted far enough in advance of the system expiration date to allow certification to continue uninterrupted. Generally, 90 days prior to the current expiration date is sufficient. This will allow time for the on-site survey to be conducted and the necessary correspondence to be completed ,i.e., sent from NAVSEA and received at your command prior to the current certification expiring.

When possible, contact the SCA by telephone at least 90 days in advance to negotiate a date for the on-site survey. Surveys are scheduled on a "first-come first-served" basis. Once you and the SCA have agreed on a date for the survey to be conducted, an official follow-up written request is required via your chain of command. The request may be by letter, NAVGRAM or Naval

Message. Past experience shows that the most efficient means for the official survey request is a letter faxed into our office (703-607-2757) marked "Attention 00C4".

1-3 Canceling the On-Site Survey

Once a firm date has been agreed to by your command and the NAVSEA SCA, every effort should be made to meet this date. As previously stated, surveys are usually scheduled well in advance of the survey itself. If for some reason the system will not be ready, it is better to cancel the survey rather than waste the SCA's time and limited travel funds. A new survey will then have to be rescheduled. Depending on the problem, this could cause your system to be placed in a non-certified status. Once certification has expired, a recertification of the system is required.

1-4 Extension of System Certification

As a last resort, an extension of system certification may be granted when an unforeseen situation arises, such as an unscheduled deployment or the surveyor being unable to travel to your location to conduct the survey. An extension should be avoided as it may involve several NAVSEA codes.

SECTION 2 - PRE-SURVEY OUTLINE BOOKLET

2-1 Updating the Pre-Survey Outline Booklet (PSOB)

A complete rewrite of the PSOB is not required for a continuation of certification. Only the affected pages need be updated. The PSOB pages for Surface Supported Diving Systems that normally require updates, assuming there are no changes to your desired operating parameters and equipment, are:

- a. ix PSOB Administrative Information
- b. xi Record of Changes
- c. 3 Flask Hydrostatic Test
- d. 9 Inspections and Tests (current period)
- e. 10 Inspections and Tests (current period) continued
- f. 12 Operation and Maintenance Procedures
- g. 13 Operation and Maintenance Procedures continued.

The PSOB pages for Recompression Chamber Systems that normally require updates are:

- a. viii PSOB Administrative Information
- b. x Record of Changes
- c. 4 Flask Hydrostatic Test
- d. 9 Inspections and Tests (current period)
- e. 12 Operation and Maintenance Procedures continued
- f. 13 Operation and Maintenance Procedures continued.

Enclosure 1 contains an example of a revised PSOB for Surface Supported Diving Systems and Enclosure 2 contains an example of a revised PSOB for Recompression Chamber Systems. The items that normally require revision are in bold capital letters.

The PSOBs must be submitted with an official cover letter to the SCA for review and approval. The PSOB must arrive in the SCA's office at least 14 days prior to the start of the scheduled on-site survey via the chain of command. For a continuation of certification, only the affected pages need to be submitted. After evaluating the revised PSOBs, the SCA will either approve them or return them to the command with change recommendations. If no changes are required, the SCA will retain the revised PSOB pages to be held until the on-site survey is conducted. If the PSOBs are returned for action, the command will then make the recommended changes. They may retain the PSOBs for the SCA to review during the on-site survey.

SECTION 3 - ON-SITE SURVEY

3-1 Conducting the On-Site Survey

Prior to arrival of the certification team, several steps can be taken to avoid unnecessary delays during the survey. The reentry control log and REC packages should be reviewed to ensure there are no open RECs and all required documents are complete. PMS should be reviewed to ensure all checks are being performed. The hose log should be checked to ensure it is up to date, correct, and complete. All component calibration and testing should be reviewed for completeness.

During the on-site survey the SCA, or a representative, will review the documents associated with the system being surveyed. The material condition of the system and associated components will also be inspected. The SCA will also witness the accomplishment of the system OP's. The documents required for review are listed below. Depending on your particular system, other documentation may be required. Appendix C contains an example of the SCA check-off sheet used for an on-site survey.

- a. PMS: Schedules should be available for the certifier's review.
- b. Reentry Control: The reentry control log, as well as work packages from the last certification period, will be reviewed to ensure all RECs have been completed and signed. The RECs will also be reviewed to ensure that system cleanliness was maintained and all strength and tightness retesting was performed. The Command Reentry Control instruction will be checked to verify that it is complete and up-to-date.
- c. Hose Log: The hose log will be reviewed to ensure all hoses have been tested and required PMS accomplished. All hoses listed in the log shall be traceable to the individual hose by a serial number or other marking system.
- d. Drawings: If the system has been modified since the last survey, drawings are checked for latest revision or red line changes. The NAVSEA approval letter for modifications shall be made available to the certifier for review.

During the continuation of certification survey, the hardware items listed below will be checked. This list is only the minimum; other items may be checked depending on the particular system.

- a. Dive System
 - (1) Intake Filters: Check Intake filter elements for cleanliness. Check housings to ensure there are no leaks and that intake air cannot bypass the element. The hold-down mechanism shall be free of rust and operate freely.

- (2) Medium Pressure Compressors: Check the pressure switch/valve to ensure the compressor engages and disengages in the required parameters and does not creep. Check that oil pressure is set in accordance with manufacturer's technical manuals. Check that proper lubricating oil is being used.
- (3) Relief Valves: Relief valves shall be set to relieve at 110% of maximum operating pressure. The valve shall be tagged with a metal tag wired to the valve. The tag shall be stamped with the valve number, set pressure, date set and the activity conducting the test. The tag shall be attached so that it can be easily read and the characters shall be legible. Ensure PMS for manually lifting relief valves has been accomplished.
- (4) Moisture Separators: Check the moisture separators to ensure that a hydrostatic test has been conducted within the required periodicity. MIL-F-22606 type moisture separators are hydrostatically tested to 5/3 the separator design pressure at 7 year intervals. Medium and high pressure separators, other than MIL-F- 22606 type, are hydrostatically tested to 150% of the maximum system operating pressure at 3 year intervals. Attention to this detail is needed since it is a common mistake. Check to ensure the drain valves operate freely and are not leaking.
- (5) Filters: Check filter housings to ensure that hydrostatic tests have been conducted to 150% of maximum system operating pressure within the last three years, elements are clean and the drain valve operates freely.
- (6) Reducers/Regulators: Check reducers and regulators to ensure they operate in the required ranges and do not creep after being operated through several cycles of flow and no flow.
- (7) System Gauges: Check all permanently installed **critical** system gauges to ensure calibration/comparison checks are current. A REC is required if pressure gauges are removed for calibration/comparison checks. In addition to the gauge sticker, a gauge calibration sheet is required.
- (8) Volume Tanks: Check the volume tanks to ensure that periodic hydrostatic testing to 150% of maximum system operating pressure has been conducted. Ensure the volume tank is in good material condition and the drain valve operates freely. The volume tank should have a metal tag attached containing date tested, test pressure and the facility conducting the test.
- (9) Piping Brackets: Check that all piping brackets are in place, properly tightened and that brackets are not used to support other items. All piping brackets shall contain liners.

- (10) Dust Caps: Check that dust caps are accessible for each open-ended connection and that caps are being utilized.
- (11) Interface Hoses: Other than umbilicals and pneumofathometer hoses, all hoses used in diving are classified as interface hoses. During the on-site survey, interface hoses will be checked to ensure they are in good material condition. The hoses are also checked to ensure the attached metal tags contain the following information:
 - (a) Testing activity
 - (b) Date tested (month/year)
 - (c) Working pressure
 - (d) Test pressure
 - (e) Proof pressure and date tested.

* Check PMS to ensure hoses are inspected prior to each use for interconnecting hoses and annually for permanently installed hoses.
- (12) System gas flasks
 - (a) Verify all DOT gas flasks have been tested at a DOT approved test facility.
 - (b) Verify all MIL-SPEC gas flasks have been tested in accordance with the specification requirements.
- (13) Valves: The following documentation is required for any new valves installed since the last survey:
 - (a) Valve manufacturer
 - (b) Valve model number
 - (c) Valve material (body and components)
 - (d) Valve body shall be hydrostatically tested to 150 percent of maximum system operating pressure for a minimum of five (5) minutes
 - (e) Seat tightness test at maximum system operating pressure
 - (f) Cleaning documentation
 - (g) REC.

b. Recompression Chamber

- (1) Viewports: Check that acrylic viewports are less than ten years old and are free of any chipping, cracking or crazing. Viewport certification sheets, including a hydrostatic and temperature test, shall be retained for certifier's review.

- (2) Chamber Relief Isolation Ball Valve: Check that the ball valve is wired in the open position and that warning plate is posted.
- (3) Door Gaskets: Check that door gaskets are properly installed and that there are no cuts, abrasions or cracking. Check that the door seals properly.
- (4) Door Dogs: Check that the dogs operate properly and the door seals evenly.
- (5) Plugs: Check that chamber plugs are not corroded, especially in the bilge drain area, and ensure the plugs do not leak.
- (6) Oxygen Bibs: Breathe the bibs to ensure a tight seal and that bibs are operating properly. Check that the masks straps and face seals are in good condition and the regulators do not leak. Check operation on surface and at depth if certification status allows.
- (7) Oxygen/Air Bottles: DOT bottles are checked for material condition and hydrostatic test dates.
- (8) Hearing Protection: Check that a small equalization hole is drilled into each ear piece, the sealing surface is in good condition.
- (9) Medical Lock: On chambers with medical locks, ensure that the lock operates properly and is clean and dry.
- (10) Interior Lamps: Check that 40-watt bulbs are installed on chambers with interior lighting. Ensure that interior wiring is in good condition, properly protected and cannot be used as a **handhold**. Check pressure proof globes are not chipped or cracked.
- (11) Emergency Lighting: Check that all emergency lighting operates properly.
- (12) Bedding: Check that the mattress and bedding is of a fire resistant material.
- (13) Bilges: Check that the bilges and medical lock are clean and dry.
- (14) Pressure Test: Check that a pressure test has been conducted during the past two years as required by the U.S. Navy Diving Manual, Volume 5, Chapter 22
This test is also required each time the chamber is moved.

- (15) Deck Plates: Check that the deck plates are clean and properly secured.
- (16) Internal Fire Extinguisher (if available): Check that it is correctly modified.

In chambers with the modernization alteration installed check that the following equipment operates properly:

- a. heater/chiller
- b. carbon dioxide scrubber
- c. oxygen analyzer
- d. carbon dioxide analyzer
- e. thermometer
- f. Cauty light intensity controls.

The test steps listed below are required if the interior of the chamber has been painted and will verify that it has cured properly. Air sample results should also be made available for the certifier.

- a. Press the chamber to 60 feet
- b. Hold at depth for 24 hours
- c. Take bomb sample from gauge line or some other connection
- d. Sample for the following contaminants:

<u>Contaminant</u>	<u>Max. Limit (PPM)</u>
Butyl Alcohol	100
Isopropanol	50
Toluene	200
Methyl Isobutylkeytone	100
Vinyl Chloride	1

Diving Manual: U.S. Navy Diving Manual 0910- LP-708-8000, must be on station. Additional information can be found on the system certification requirements checklist provided with this document.

3-2 Discrepancies

During the survey, the SCA will furnish a list of any discrepancies to the senior system representative and offer time for corrections prior to completion of the survey. However, the survey will not be extended to allow time for discrepancies to be corrected.

3-3 System Demonstration

During the survey the SCA may or may not require a manned demonstration of the system. Surface supported diving systems are required to be lined up and the divers breathing medium supplied to the divers manifold. This is required in order to verify that all system components in the scope of certification operate properly and that the operating procedures are adequate.

Unmanned chamber runs will be required for recompression chamber systems. The primary system will be required to press the inner lock to 40 feet at 80 FPM and then to 165 at 20 FPM. The chamber will be returned to the surface and the secondary system lined up. The inner and outer lock will be pressed to 165 feet utilizing the secondary system. The time to press should be no greater than approximately 8 minutes or 20 FPM. Once the chamber is at depth, it will be vented and held at depth long enough to allow time to check for leaks.

3-4 System Certification Survey Cards (SCSCs)

Brief descriptions of each category are listed below.

- a. Category 1A - Corrective action must be accomplished prior to manned use of the system.
- b. Category 1B - Corrective action must be accomplished prior to system certification.
- c. Category 1C - Corrective action must be accomplished prior to the date or event specified on the card in order to sustain certification.
- d. Category 1D – Must be accomplished on specified component prior to it's use, but the overall system retains it's certification.
- e. Category II - Corrective action is desirable, but not mandatory.

If a Category 1A or 1B card is generated during the survey, the system is no longer in a continuation of certification status. Issuing either of these two category cards terminates system certification.

When a Category 1C card is issued, sufficient time will be allowed to correct the discrepancy. The due date of the card is dependent on the nature of the discrepancy and the geographical location of the system. For example, a longer lead time would be allowed to correct a discrepancy on a system in Diego Garcia than to correct a discrepancy on a system in Norfolk, Virginia. Category 1C cards should not be taken lightly. If the card is allowed to expire, system certification is terminated.

At the completion of the survey, preliminary SCSCs will be written for any discrepancies that could not be corrected during the survey and given to the diving command for information. Preliminary cards are subject to change by the SCA in either wording or the category of the card, prior to being formally issued. If this happens the command will be notified prior to issuing the finalized SCSC.

3-5 Debrief

When the survey is complete and the preliminary cards are written, a debrief of the survey is carried out by the certification team. The commanding officer, diving officer and other personnel with an interest in the certification process are usually present at the debrief.

During the debrief, the SCA will go over the results of the survey. All questions concerning the survey will be answered and recommendations given on any problem areas. Each SCSC will be discussed in detail, describing the condition that exists, the recommended correction and the associated references.

SECTION 4 - ISSUING CERTIFICATION

4-1 SCA Documentation Review

When the on-site portion of the survey is complete, the system certification manager will submit the system certification documentation to the SCA for review and approval. The SCA will review the results of the on-site survey and make changes to SCSCs as required. The SCA will then either terminate or continue system certification. The SCA will then issue a Continuation of Certification letter or a Termination letter.

ENCLOSURE (1)

**PRE-SURVEY OUTLINE BOOKLET
FOR
U.S. NAVY RECOMPRESSION CHAMBER SYSTEMS**

NAVSEA 0994-LP-014-0010

REVISED AUGUST 20 1999

PRE-SURVEY OUTLINE BOOKLET FOR U.S. NAVY RECOMPRESSION CHAMBER SYSTEMS



**SYSTEMS CERTIFICATION AUTHORITY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON DC 20362**

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CERTIFICATION OF U.S. NAVY RECOMPRESSION CHAMBER SYSTEMS

PURPOSE

By CNO directive, U.S. Navy recompression chambers are subject to the requirements of system certification. The system certification process can be summarized as a systematic technical review and survey to ensure that a system is capable of performing its intended mission within acceptable limits of personnel safety when used in accordance with approved operating and maintenance procedures. The primary objective of the system certification process is, therefore, the development of an adequate design that is properly installed and which poses a minimum acceptable risk to the divers and operating personnel. It is emphasized that the System Certification Authority (SCA) grants system certification based on a given set of design, operational and maintenance parameters. Such certification, therefore, does not relieve the system sponsor of the responsibility to operate the system safely and to maintain it as a safe diving system on a continuing basis. The governing document of system certification is NAVSEA SS521-AA-MAN-010, U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual. This publication must be referred to in order to obtain a more complete understanding of the certification process.

APPLICABILITY

System Certification applies to any afloat or portable diving system that is used by U.S. Navy (Military) or Department of the Navy (Civilian) personnel. If the lease, charter or contract for a diving system does not involve the safety of Navy personnel then the system need not be certified.

It is important to recognize the fact that a recompression chamber system includes some form of the following:

1. Pressure Vessel for Human Occupancy
2. Source of recompression chamber primary and secondary gas supply (i.e., air compressors or high pressure flasks)
3. Electrical power source for voice communications equipment, lighting, and/or CO₂ Scrubber unit
4. Gas BIBBS and exhaust

APPROACH

The approach to certification of a U.S. Navy recompression chamber system, as reflected in this booklet, is as follows (see Figure 1, page iv, for certification flow chart):

1. Certification application: Identify system parameters in general terms and request certification tenure period.
2. Determine all recompression chamber operation requirements, including types of equipment to be used (i.e., define the "Scope of Certification").
3. Calculate all air/gas system requirements for the most demanding recompression chamber scenario (e.g., pressure, flow rate, stored oxygen volume).

meets or exceeds quantity, pressure and storage requirements established in paragraph 3 above.

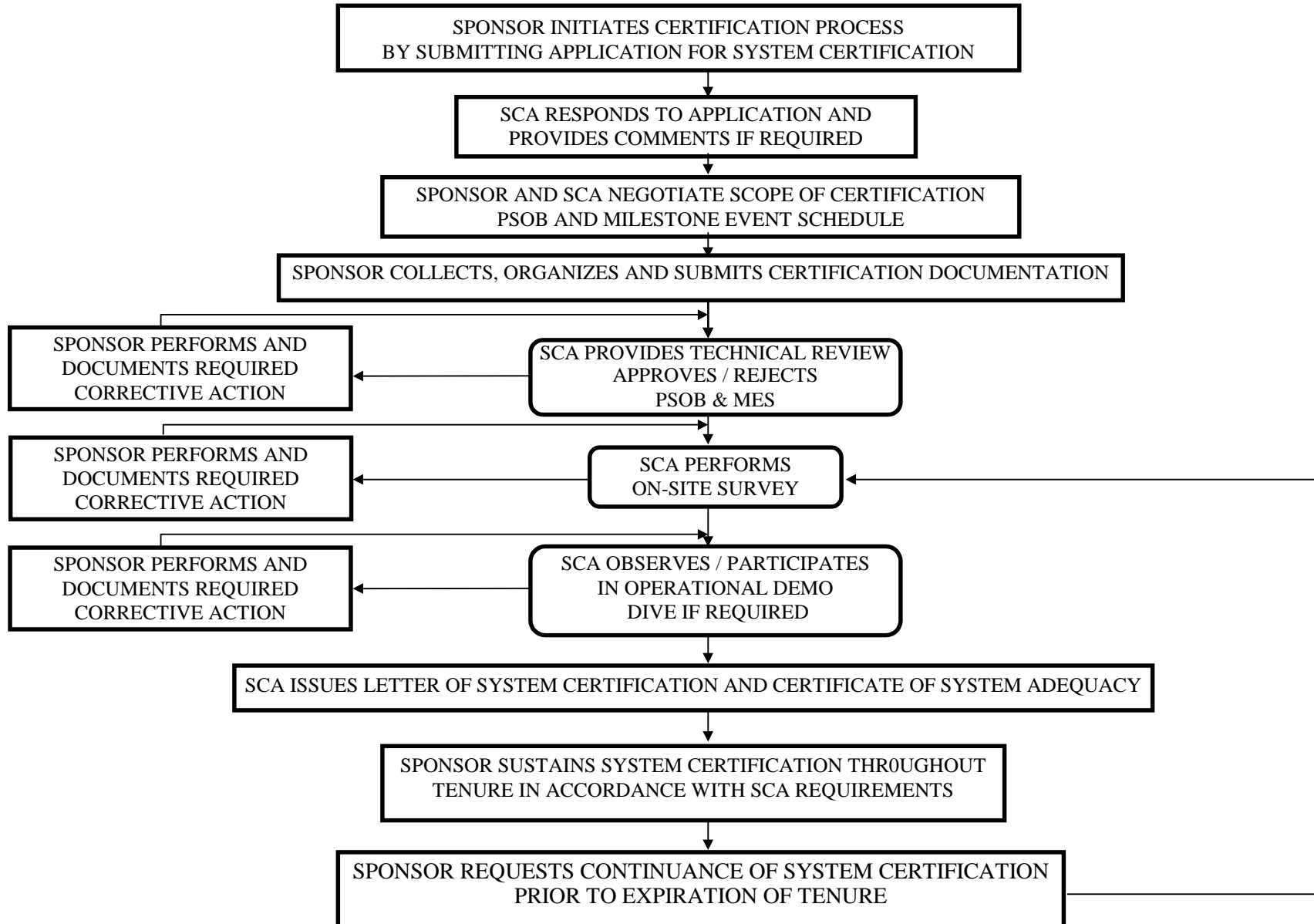
5. Provide documentation to verify/assure that the design was fabricated, installed, and tested in accordance with NAVSEA approved procedures, requirements and guidance.
6. Survey, first hand, the installed recompression chamber system to verify the "as built" configuration and material condition.
7. Review system operating, emergency and maintenance procedures to ensure compliance with pertinent directives and approved practices.

Technical documentation required in support of system certification should be furnished to the SCA by the system sponsor or technical agent. This documentation includes:

- System schematics detailed drawings
- Material lists (drawing bills of material)
- Objective Quality Evidence (Certificates of compliance of material and components)
- Installation/fabrication procedures (welding, brazing, cleaning, inspection, etc.) Installation/fabrication documentation to include Installation/fabrication testing records (pass/fail criteria, technical evaluation of test data, etc.)
- Personnel qualifications (welders, brazers, NDT inspectors, etc.)
- Pre-operational and operational testing records (pass/fail criteria, technical evaluation of test data)
- System cleaning procedures and documentation
- Most recent air samples
- Maintenance plan (PMS, MRCs, etc.) (approved by NAVSEA OOC3)
- Hose log
- Operating and emergency procedures (approved by NAVSEA OOC3)
- Reentry control procedures and records.

For specific details concerning these technical documentation requirements, refer to NAVSEA SS521-AA-MAN-010, U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual.

MAJOR MILESTONE EVENTS



TENURE OF CERTIFICATION

The granting of system certification by the SCA does not automatically ensure that system certification will remain effective for the full period. System certification is not granted for the entire design life of the equipment. In general, the time period for which system certification will initially be granted (Tenure of System Certification) is based on the operating and test histories of related systems. The tenure of system certification may be negotiated to coincide with planned events such as overhaul and refurbishment. System Certification shall be terminated as a result of any of the following:

1. Expiration of tenure of system certification
2. Major overhaul or design configuration change for the recompression chamber system
3. Breaching of the scope or terms of system certification
4. Recognition of the existence of an unsafe condition
5. Expiration of a lease or contract

When the initial period of certification expires or is terminated due to any of the above reasons, it may be extended or renewed by either "Continuance" or "Recertification", as applicable.

Continuance of system certification is the extension of the system certification period, by the SCA, beyond that initially granted. This is normally considered to accommodate continued use of systems that have no changes to the basic design, scope of system certification or operating limits.

Recertification is a new certification of system adequacy for a diving system with an expired or invalidated certification. In order to recertify, the applicant may be required to reestablish a scope of system certification, provide recordable evidence as noted in a renegotiated Pre-Survey Outline Booklet (PSOB), and fulfill all other requirements that were necessary for the initial system certification.

USE OF THE PRE-SURVEY OUTLINE BOOKLET

This PSOB is arranged in the form of a check-off list. The items on this list are those areas of consideration upon which, when fully explored, the SCA can base a decision to certify surface supported diving systems employing standard Navy diving equipment. Documentation covering each of the Items I through VIII should be assembled by the system applicant and forwarded to the SCA (NAVSEA OOC). When documentation has been furnished to the SCA, it is reviewed and maintained for verification during the on-site survey.

Should the SCA ascertain the need for additional information or documentation, then the applicant will be notified. When the required documentation cannot be provided, alternate means of satisfying the interest in that area may become a matter for negotiation between the applicant and the SCA.

When Items I through VIII have been sufficiently covered, the SCA will carry out item IX. During this on-site survey, the actual installation will be inspected first hand by a certification team of individuals who performed the technical reviews. Should deficiencies be identified during the on-site survey, System Certification Survey Cards will be written and forwarded by official correspondence via the appropriate chain of command for correction (see NAVSEA SS521-AA-MAN-010 for additional information). If no IA cards are written or when IA cards are satisfactorily corrected, an operational demonstration of the system shall be conducted with the participation of the SCA or his designated representative. This operational demonstration shall be conducted to the maximum depth for which certification is being requested. Upon correction of all category IA and IB cards, the SCA will forward a certificate stating the tenure of certification and specifying any limitations of the use that have been negotiated between the applicant and the SCA.

CLOSING REMARKS

System certification is intended to be a methodical, independent review of the documentation verifying that (a) system elements have been designed and constructed of proper materials and assembled, cleaned and performance tested in accordance with accepted engineering practices and (b) the operating and maintenance documents provide sufficient information to allow the system to be operated safely.

This independent review and effective control of design, fabrication, testing, construction, inspection, maintenance and operation is necessary because of the complexity of the systems involved and the potential impact on safety.

System certification is the final Navy check to ensure that no recognizable unsafe conditions exist in the system prior to its manned use.



Robert L. Warren, NAVSEA OOC
System Certification Authority

RECOMPRESSION CHAMBER PSOB ADMINISTRATIVE INFORMATION

Ship/Command _____

Type Commander _____

Home Port _____

Address _____

System _____

Manufacturer _____

Serial Number _____

The responsibility to act as the sponsor, as defined by NAVSEA SS521-AA-MAN-010, is held by

Command/Activity/Organization

PSOB prepared by _____

Name, Title and Organization	Signature	Date
Sponsor approval _____		
Name, Title and Organization	Signature	Date
NAVSEA SCA approval _____		
Name	Signature	Date

REVISIONS						
No.	Prepared by	Date	Approved by	Date	Approved by SCA	Date

REVISING THE PRESURVEY OUTLINE BOOKLET

A new PSOB should be submitted under the following conditions: a new system, a re-certification, or a continuation of certification.

A PSOB should be revised under the following condition: when changes are made to the system during tenure of certification and will be annotated in the record of changes.

When the tenure of certification nears expiration, and a "Continuance of Certification" is requested, selected pages of the PSOB reflect the latest information pertaining to the Recompression Chamber System (RCS). The pages and times normally requiring revision are as follows:

1. Page viii - Administrative Information - complete revision block.
2. Page x - Record of Changes - enter all changes made.
3. Page 8 - Inspections and Tests (current period)

- Item VI
 - A. Provide status
 - B. Provide date and results
 - C. Provide date and results
 - D. Provide date and results
 - E. Provide latest dates
 - G. This item will require revision only if permanently installed hoses have been changed.

4. Pages 10, 11 & 12 - Operation and Maintenance Procedures

- Item VII
 - A. If OPs/EPs have been changed since approval by NAVSEA 00C3, enter the serial number and date of letter authorizing change.
 - C. List any outstanding feedbacks remaining open.
 - D. Enter appropriate "Quarter after overhaul number".
 - E. Enter total number of RECs issued since last on-site survey.

5. Pages 13 & 14 - On-site Survey - These pages will be revised by the SCA during the on-site survey.
6. Page 15 - Operational Demonstration

RECORD OF CHANGES

REV NO.	DATE	PAGE NO.	ITEMS CHANGED (LTR)	ENTERED BY

ITEM I: RECOMPRESSION CHAMBER IDENTIFICATION			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>NOTE: The recompression chamber includes the air and gas manifolds, lighting, communications and their associated wiring, connection boxes, etc. that are attached to the chamber.</p> <p>A. Identification of Chamber</p> <ol style="list-style-type: none"> 1. Working Pressure 2. Number of Locks 3. Shell Material 4. Riveted or welded construction 5. ASME code stamp 6. Serial Number 7. Manufacture 8. Date of Manufacture 9. National Board Number 10. Viewport Material and Serial Number if Acrylic 11. Volume Inner Lock 12. Volume Outer Lock <p>B. Identify modifications to chamber's original configuration. Include modifications to manifold & lighting, communications, wiring, etc.</p>			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM II: RECOMPRESSION PROFILE/OPERATING PARAMETERS			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>A. Describe the most demanding chamber operations contemplated. Include treatment tables, number of patients, number of tenders and pressurization and decompression requirements of tenders locking in and out. Identify SUR "D".</p> <p>B. Provide here a summary only of air/oxygen "required" and air/oxygen "available". Supporting calculations for these air/oxygen figures should be provided in appendix A. Air/oxygen available must be equal to or greater than the air/oxygen required for both quantity (volume) and pressure.</p> <p>NOTE: For a standard recompression chamber, calculations should be based for a TT 4 using O2 (unless authorized by NAVSEA OOC4)</p>			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM II: RECOMPRESSION PROFILE/OPERATING PARAMETERS --- Continued			<input type="checkbox"/> PLACE AN "X" IN BOX IF NOT APPLICABLE	
REQUIREMENT	STATUS		RESPONSE *	
	DATE #	APVD #		
<p>EXAMPLE:</p> <p>Options: TRC VCM _____ is authorized to be mated with VCM's _____ and associated gas racks. Under this option, the most demanding operation is treatment table 4, for 1 tender and 1 patient. Chamber is capable of completing all aspects of air and oxygen surface decompression tables, and diver candidate pressure testing</p>			<p style="text-align: center;">STANDARD CUBIC FEET AIR/OXYGEN REQUIRED AND AVAILABLE</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>AIR</p> <p>PRIMARY SCF REQUIRED</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> <p>MMP</p> <p>SCF AVAILABLE</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> </div> <div style="text-align: center;"> <p>SECONDARY SCF REQUIRED</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> <p>MMP</p> <p>SCF AVAILABLE</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> </div> </div> <div style="display: flex; justify-content: center; align-items: center; margin-top: 20px;"> <p>OXYGEN</p> <div style="margin-left: 20px;"> <p>PRIMARY SCF REQUIRED</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> <p>MMP</p> <p>SCF AVAILABLE</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> </div> </div>	

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM III: RECOMPRESSION CHAMBER AIR SUPPLY			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>A. Provide drawing number of schematic diagram of systems that furnish recompression chamber air, showing all compressed air sources all air controls, and all processing equipment. Include operational parameters, such as pressure and volume, for appropriate components on the schematic. Also include the date when the drawing was validated.</p> <p>B. Provide drawing number of detailed plans of air piping covered in schematic diagram.</p> <p>C. Provide air compressor identification and characteristics</p> <p>D. Provide compressed air processing equipment identification and characteristics (filters, separators, regulators, flow meters, etc.)</p> <p style="margin-left: 40px;">D.1. Moisture Separators: (MIL-F-22606) Yes____ No____</p> <p style="margin-left: 40px;">Filter Housings:</p> <p style="margin-left: 40px;">Volume Tanks:</p>			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM III: RECOMPRESSION CHAMBER AIR SUPPLY SYSTEM --- Continued								
REQUIREMENT	STATUS		RESPONSE *					
	DATE #	APVD #	SERIAL NO.	RACK/ PRESSURE	SPEC	HYDRO./ UT DATE	DUE DATE	SYSTEM
<p>E. *Provide H.P. air flask identification by serial number (MIL-STD, DOT, etc.) and date of last Recertification Test.</p> <p>NOTE: This section should also include any additional command certified H. P. Air Flasks to be used in conjunction with this system.</p>								

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM III: RECOMPRESSION CHAMBER AIR SUPPLY SYSTEM --- Continued			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
F. Identify recompression chamber's primary and secondary air supply and describe procedures for shifting to secondary air supply.			
G. Identify demands placed on compressed air systems other than supplying chamber. Will this demand be used during chamber operations? If yes, show that demand will not degrade system performance or cleanliness			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM III: RECOMPRESSION CHAMBER AIR SUPPLY SYSTEM --- Continued								
REQUIREMENT	STATUS		RESPONSE *					
	DATE #	APVD #	SERIAL NO.	RACK/ PRESSURE	SPEC	HYDRO./ UT DATE	DUE DATE	SYSTEM
<p>H. Provide mixed gas/oxygen flask identification by serial number, size, pressure, and MIL-SPEC (MIL-SPEC-F-22606, DOT, etc.), and date last hydrostatically tested.</p> <p>NOTE: The oxygen system supporting the chamber extends from the chamber connection to, and including, the oxygen sources.</p>								

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM IV: RECOMPRESSION CHAMBER GAS SUPPLY			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
A. Provide NAVSEA drawing numbers of schematic diagram of system(s) that furnish recompression chamber oxygen, showing all storage flasks, controls, and processing equipment List NAVSEA approval information.			
B. Provide NAVSEA drawing numbers of detailed plans of the oxygen system covered in schematic diagram.			
C. Provide oxygen processing equipment identification and characteristics (filters, regulators, etc.).			
D. Identify demands placed on oxygen system other than supplying the recompression chamber.			
E. Identify chambers oxygen supply and describe procedures for supplying oxygen to the recompression chamber.			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM IV: RECOMPRESSION CHAMBER OXYGEN SUPPLY SYSTEM --- Continued			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
F. Provide manufacturers model and serial number for the following. <ol style="list-style-type: none"> 1. Oxygen back pressure regulator 2. Oxygen pressure regulator 3. Oxygen monitor 4. Oxygen BIBS masks 5. CO2 Monitor 			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM V: ELECTRICAL SYSTEMS SUPPORTING RECOMPRESSION CHAMBER OPERATIONS			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>A. Provide NAVSEA drawing number of schematic diagram of electrical circuits that support the recompression chamber.</p> <p>1. Lighting 2. Environmental Packaging 3. GFI</p> <p>B. Describe primary and secondary (emergency) lighting arrangements for recompression chamber operations.</p>			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VI: INSPECTIONS AND TESTS (CURRENT PERIOD)			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
A. Provide status report of known material deficiencies for recompression chamber and support systems.			
B. Report date and results of last system tightness integrity test of air and oxygen piping systems in accordance with PMS.			
C. Provide date and results of last recompression chamber pressure/leak test conducted in accordance with the U. S. Navy Diving Manual, Volume 1, Air Diving (NAVSEA 0994-LP-001-9010), Appendix D.			
D. Provide date and results of latest air purity and oxygen/mixed gas purity documentation			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VI: INSPECTIONS AND TESTS (CURRENT PERIOD) CONT.							
REQUIREMENT	STATUS		RESPONSE*				
	DATE#	APVD#	HOSE NO.	MFG.	P/N	WORKING	TEST
F. Report manufacturer, manufacturer's part number, and working, test data for all flexible hoses permanently installed in the system Include interconnecting hoses for portable systems. Continue on another sheet if necessary.							

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VII: OPERATION AND MAINTENANCE PROCEDURES			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>A. Provide operating and emergency procedures for the overall diving system. Indicate that OPs and EPs have been:</p> <ol style="list-style-type: none"> Validated by ship's force Reviewed and approved by NAVSEA <p>B. Provide preventive maintenance system (PMS) instructions for overall diving system. Ensure the following systems/components are covered by MIPs and MRCs:</p> <ol style="list-style-type: none"> Compressors Flasks Volume Tanks Filters Moisture separators View Ports Chamber communications Regulating and reducing valves System gages Relief valves System valves Door gaskets System flexible hoses Lights (primary/emergency) Oxygen breathing masks Sound Powered Phones Power Cables/Ground Straps Receptacles Air Samples Environmental Control System 			<p>A1 Date validated:</p> <p>Validated by:</p> <p>A2 NAVSEA approval letter serial, date:</p> <p><u>LIST APPLICABLE MAINTENANCE INDEX PAGE NUMBERS</u></p>

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VII: OPERATION AND MAINTENANCE PROCEDURES --- Continued			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>C. 1. List all PMS related deficiencies. 2. List all PMS feedbacks concerning the recompression chamber/support systems submitted since last certification.</p> <p>NOTE: These deficiencies will include all MRCs not performed as required or as scheduled.</p> <p>D. Provide quarterly schedules for the current and previous four quarters for review by SCA. For systems/equipment not covered by PMS list the command maintenance instruction number and submit the maintenance program to SCA for review.</p>			

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VII: OPERATION AND MAINTENANCE PROCEDURES --- Continued					
REQUIREMENT	STATUS		RESPONSE *		
	DATE #	APVD #	REC NO.	DATE	SHORT TITLE
E. List by number and short title all reentry control (REC) procedures issued since last certification. Provide REC procedures/ instructions for review by SCA during on-site survey.					

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VIII: ONSITE SURVEY (NOTE: Request Survey via Sponsor to NAVSEA.)					
REQUIREMENT	STATUS				RESPONSE *
	DATE #	APVD #	SAT	UNSAT	
<p>NOTE: This item is performed by the System Certification Authority.</p> <p>A. Inspection of material condition of recompression chamber equipment and support systems.</p> <p>B. Verification of accessibility to vital equipment</p> <ol style="list-style-type: none"> 1. Vital valves, components, and gages 2. Communications equipment 3. Electrical power <p>C. Verification of conformance to 'as built' drawings.</p> <p>D. Verification of material identification and control (LEAKS., records versus hardware).</p> <p>E. Verification of material condition of view ports (ie-, chips, scratches, cracks, crazing, etc.) and their date of manufacture</p> <p>F. Verification of oxygen system operability.</p> <p>G. Review of reentry control records.</p> <p>H. Review of fabrication, construction, and assembly procedures/records.</p>					

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM VIII: ONSITE SURVEY --- Continued					
REQUIREMENT	STATUS				RESPONSE *
	DATE #	APVD #	SAT	UNSAT	
I. For initial construction or refurbished systems, review of test plans/procedures/records for fabrication, construction, and assembly.					
J. Review of proof and <u>performance</u> test procedures/records (i.e., leak tests, hydrostatic tests, operational tests, etc.).					
K. Review of system cleaning procedures and records.					
L. Review of current system air sampling results.					
M. Review chamber painting procedures and records.					

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

ITEM IX: OPERATIONAL DEMONSTRATION (FOR SCA USE ONLY)			
REQUIREMENT	STATUS		RESPONSE *
	DATE #	APVD #	
<p>A. Date of operational demonstration. Primary air demonstration to 165 feet.</p> <p>1. Maximum depth achieved 2. Total time to descend</p> <p>(Inner lock only. 80 fpm to 40') (No time limit to 165')</p> <p>B. Secondary air demonstration to 165 feet.</p> <p>1. Maximum depth achieved 2. Total time to descend</p> <p>(Inner and outer locks. No time limit.)</p> <p>C. General comments.</p>			

This recompression chamber system has been found to be operationally functional and post-dive inspection verifies that no condition exists or has developed as a result of the operational demonstration which could be dangerous or impair the satisfactory operation of this system.

Signature and date

#- For SCA use only: date and initial

*- Should response exceed space provided, use continuation sheet

APPENDIX A: SUPPORTING AIR/MIXED GAS CALCULATIONS

ITEM ____ --- Continuation Sheet

ENCLOSURE (2)

**PRE-SURVEY OUTLINE BOOKLET
FOR
U.S. NAVY SURFACE SUPPORTED DIVING SYSTEMS**

**NAVSEA 0994-LP-014-0010
REVISED AUGUST 20 1999**

PRE-SURVEY OUTLINE BOOKLET FOR U.S. NAVY SURFACE SUPPORTED DIVING SYSTEMS



**SYSTEMS CERTIFICATION AUTHORITY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D.C. 20362**

TABLE OF CONTENTS

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Pre-Survey Outline Checklist	
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Continuation Sheet Blanks

CERTIFICATION OF U.S. NAVY SURFACE SUPPORTED DIVING SYSTEMS

PURPOSE

By CNO directive, U.S. Navy diving systems are subject to the requirements of system certification. The system certification process can be summarized as a systematic technical review and survey to ensure that a system is capable of performing its intended mission within acceptable limits of personnel safety when used in accordance with approved operating and maintenance procedures. The primary objective of the system certification process, therefore, is the development of an adequate design that is properly installed and which poses a minimum acceptable risk to the divers and operating personnel. It is emphasized that the System Certification Authority (SCA) grants system certification based on a given set of design, operational, and maintenance parameters. Such certification, therefore, does not relieve the system applicant of the responsibility to operate the system safely and to maintain it as a safe diving system on a continuing basis. The governing document of system certification is NAVSEA SS521-AA-MAN-010, *U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual*. This publication must be referred to in order to obtain a more complete understanding of the certification process.

APPLICABILITY

System Certification applies to any afloat or portable diving system that is used by U.S. Navy (Military) or Department of the Navy (Civilian) personnel. If the lease, charter or contract for a diving system does not involve the safety of Navy personnel, then the system need not be certified.

It is important to recognize that a complete surface supported diving system includes some form of the following:

1. Source of Diver's air or gas (i.e., air compressors or high pressure flasks)
2. Diver Control Console.
3. Electrical power source for voice communications equipment.
4. Diver umbilical and diver worn life support equipment.

5. Diver handling equipment.

Additionally, it is important to realize that in many cases the surface support system may be certified for less than that of its designed depth or the design limits of the diver worn equipment. The actual certification depth limit is negotiable with the SCA.

APPROACH

The approach to certification of a U.S. Navy surface supported diving system, as reflected in this booklet, is as follows (see, page V, for certification flow chart):

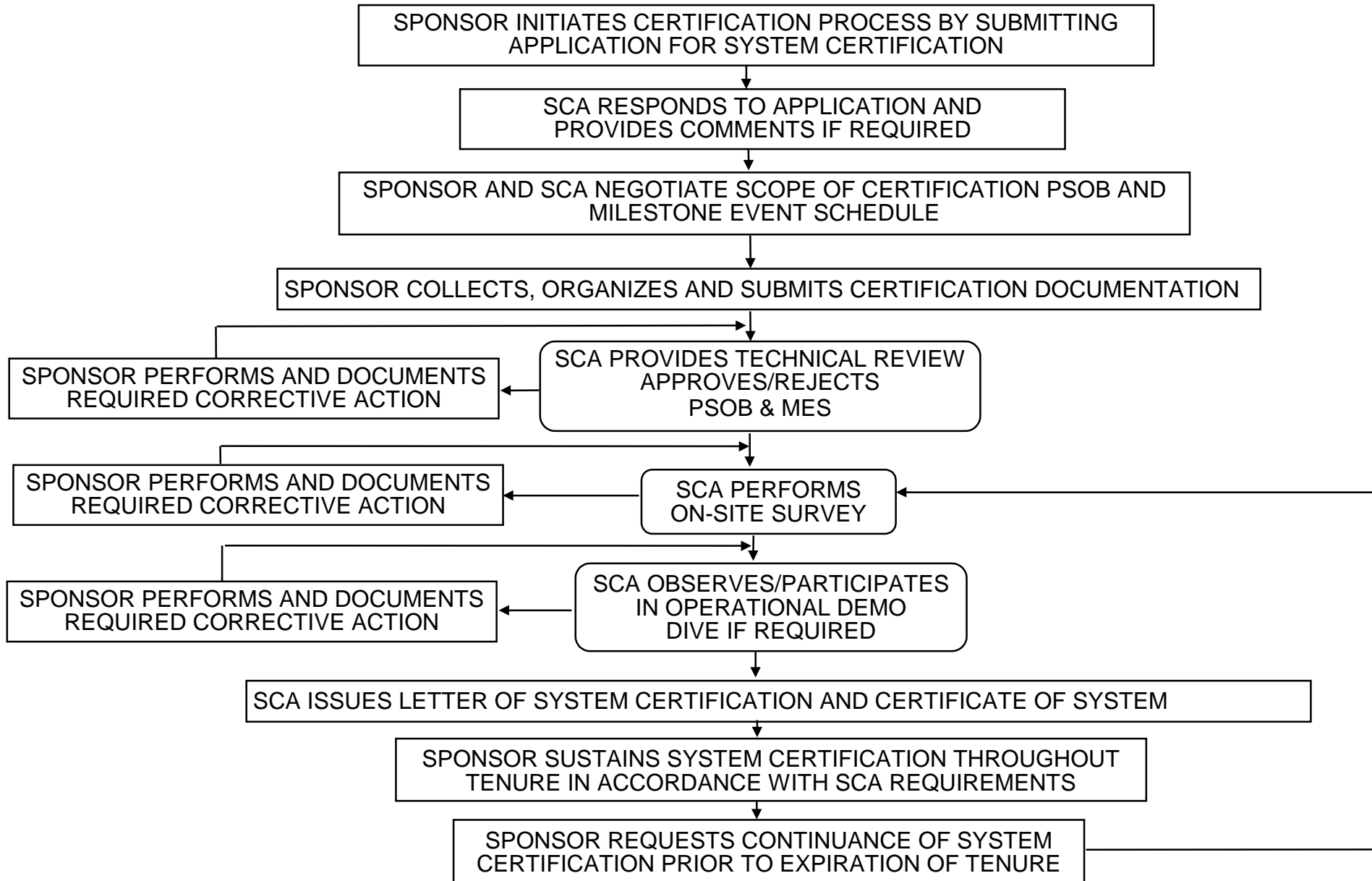
1. Certification application: Identify system parameters in general terms and request certification tenure period.
2. Scope of Certification: Determine all diving operation requirements, including types of equipment to be used.
3. Calculate all air/gas system requirements for the most demanding diving scenarios (e.g., pressure, flow rate, stored gas volume).
4. Establish, in detail, the design configuration of the diver's air/gas supply system and determine that it meets or exceeds quantity, pressure and storage requirements established in paragraph 3 above.
5. Provide documentation to verify and assure that the system was fabricated, installed and tested in accordance with approved procedures, requirements and guidance.
6. Conduct on-site survey of installed diving systems to verify the "as built" configuration and material condition.
7. Review system operating, emergency and maintenance procedures to ensure compliance with pertinent directives and approved practices.

Technical documentation required in support of system certification should be furnished to the SCA by the system applicant or acquisition manager. This documentation at a minimum includes:

- System schematics detailed level II drawings (approved by NAVSEA)
- Material lists (drawing bills of material)
- Objective Quality Evidence (Certificates of compliance of material components)
- Installation/fabrication procedures (welding, brazing, cleaning, inspection, etc.)
- Installation/fabrication documentation to include testing records (pass/fail criteria, technical evaluation or test data, etc.)
- Personnel qualifications (welders, brazers, NDT Inspectors, etc.)
- System cleaning procedures and documentation
- Most recent air samples
- Maintenance plan (PMS, MRCs, etc.) (approved by NAVSEA 00C3)
- Hose log
- Operating and emergency procedures (approved by NAVSEA 00C3)
- Re-entry Control procedures and records

For more guidance concerning these technical documentation requirements, refer to NAVSEA SS521-AA-MAN-010, *U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual*.

MAJOR MILESTONE EVENTS



TENURE OF CERTIFICATION

The granting of system certification by the SCA does not automatically ensure that system certification will remain effective for the full period. System certification is not granted for the entire design life of the equipment. In general, the time period for which system certification will initially be granted (Tenure of System Certification) is based on the operating and test histories of related systems. The tenure of system certification may be negotiated to coincide with planned events such as overhaul and refurbishment. System Certification shall be terminated as a result of the following:

1. Expiration of tenure of system certification
2. Major overhaul or design configuration change for the diving system
3. Breaching of the scope or terms of system certification
4. Recognition of the existence of an unsafe condition
5. Expiration of a lease or contract

When the initial period of certification expires or is terminated due to any of the above reasons, it may be extended or renewed by either “Continuance” or “Recertification”, as applicable.

Continuance of system certification is the extension of the system certification period, by the SCA, beyond that initially granted. This is normally considered to accommodate continued use of systems that have no changes to the basic design, scope of system certification or operating limits.

Recertification is a new certification of system adequacy for a diving system with an expired or invalidated certification. In order to recertify, the applicant shall reestablish a scope of system certification, provide recordable evidence as noted in a renegotiated Pre-Survey Outline Booklet (PSOB), and fulfill all other requirements that were necessary for the initial system certification.

USE OF THE PRE-SURVEY OUTLINE BOOKLET

This PSOB is arranged in the form of a check-off list. The items on this list are those areas of consideration upon which, when fully explored, the SCA can base a decision to certify surface supported diving systems employing standard Navy diving equipment. Documentation covering each of the Items I through VIII should be assembled by the system applicant and forwarded to the SCA (NAVSEA OOC). When documentation has been furnished to the SCA, it is reviewed and maintained for verification during the on-site survey.

Should the SCA ascertain the need for additional information or documentation, then the applicant will be notified. When the required documentation cannot be provided, alternate means of satisfying the interest in that area may become a matter for negotiation between the applicant and the SCA.

When Items I through VIII have been sufficiently covered, the SCA will carry out item IX. During this on-site survey, the actual installation will be inspected first hand by a certification team of individuals who performed the technical reviews. Should deficiencies be identified during the on-site survey, System Certification Survey Cards will be written and forwarded by official correspondence via the appropriate chain of command for correction (see NAVSEA SS521-AA-MAN-010 for additional information). If no IA cards are written or when IA cards are satisfactorily corrected, an operational demonstration of the system shall be conducted with the participation of the SCA or his designated representative. This operational demonstration shall be conducted to the maximum depth for which certification is being requested. Upon correction of all category IA and IB cards, the SCA will forward a certificate stating the tenure of certification and specifying any limitations of the use that have been negotiated between the applicant and the SCA.

CLOSING REMARKS

System certification is intended to be a methodical, independent review of the documentation verifying that (a) system elements have been designed and constructed of proper materials and assembled, cleaned and performance tested in accordance with accepted engineering practices and (b) the operating and maintenance documents provide sufficient information to allow the system to be operated safely.

This independent review and effective control of design, fabrication, testing, construction, inspection, maintenance and operation is necessary because of the complexity of the systems involved and the potential impact on safety.

System certification is the final Navy check to ensure that no recognizable unsafe conditions exist in the system prior to its manned use.



Robert L. Warren, NAVSEA OOC
System Certification Authority

SURFACE SUPPORTED DIVING SYSTEMS PSOB ADMINISTRATIVE INFORMATION

System_____

Manufacturer_____

System/Boat Hull No._____

Ship/Command _____

Type Commander _____

Home Port _____

Address _____

The responsibility to act as the applicant, as defined by NAVSEA SS-521-AA-MAN-010, is held by _____

Command/Activity/Organization

PSOB prepared by _____

Name, Title, and Organization	Signature	Date
-------------------------------	-----------	------

Applicant approval _____

Name, Title, and Organization	Signature	Date
-------------------------------	-----------	------

NAVSEA SCA approval _____

Name	Signature	Date
------	-----------	------

Revisions						
No.	Prepared by	Date	Approved by Applicant	Date	Approved by SCA	Date

REVISING THE PRE-SURVEY OUTLINE BOOKLET

A new PSOB should be submitted under the following conditions: a new system, a re-certification, or a continuation of certification.

A PSOB should be revised under the following condition: when changes are made to the system during tenure of certification and will be annotated in the record of changes.

When the tenure of certification nears expiration, and a “Continuance of Certification” is requested, selected pages of the PSOB reflect the latest information pertaining to the Surface Supported Diving System (SSDS). Submit PSOB, with the most current information, 90 days prior to on-site survey unless negotiated between the SCA and applicant. The pages and times normally requiring revision are as follows:

1. Page ix - Administration Information - complete revision block

2. Page xii - Record of Changes - enter all changes made

3. Pages 11, 12 & 13 - Inspections and Tests (current period)

- | | |
|----------|--|
| Item VII | A. Provide status
B. Provide date and results
C. Provide date and results
D. Provide date and results
E. Provide latest dates
F. This item will require revision only if permanently installed hoses have been changed. |
|----------|--|

4. Pages 14, 15, & 16 - Operation and Maintenance Procedures

- | | |
|-----------|--|
| Item VIII | A. If OPs/EPs have been changed since approval by NAVSEA OOC3, enter the serial number and date of letter authorizing change.
C. List any outstanding feedbacks remaining open.
D. Enter appropriate “Quarter after overhaul number.”
E. Enter total number of RECs issued since last on-site survey. |
|-----------|--|

5. Pages 17 & 18 - On-site Survey - These pages will be revised by the SCA during the on-site survey.

6. Page 19 - Operational Demonstration - The SCA (or his appointed representative), will participate in or observe the operational demonstration of the system. Exceptions to this requirement are defined in NAVSEA SS521-AA-MAN-010, *U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual*.

RECORD OF CHANGES

REV NO.	DATE	PAGE NO.	ITEMS CHANGED (LTR)	ENTERED BY

ITEM I: EQUIPMENT IDENTIFICATION			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. Identify the type of standard Navy surface supported diving equipment employed as listed in Diving Equipment Authorized for NAVY Use 10560 SER 00C/3212 of 15 May 97 or class certified.</p> <p>B. Identify any types of surface supported diving equipment employed that are not listed in NAVSEA LTR 10560 SER 00C/3212 of 15 May 97, or class certified.</p> <p>NOTE: CNO waiver must be obtained to use any non-ANU or non-class certified diving equipment. See OPNAVINST 3150.27 for additional information.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM II: OPERATING PARAMETERS			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. Describe the most demanding diving operations contemplated for each type of equipment to be used. For each configuration, include the number of divers (including standby divers) to be supported with each type, maximum depth of dives, and maximum bottom time requirements.</p> <p>Example:</p> <p>A.1 CONFIGURATION __</p> <p>(A) WILL SUPPORT TWO DIVERS AND ONE STANDBY DIVER USING OR AS FOLLOWS, TO A MAXIMUM DEPTH OF FOR MINUTES.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM II: OPERATING PARAMETERS --- CONTINUED			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>B. Provide a summary of air/gas quantity requirements and availability for each equipment listed, including air/gas for decompression. Provide pressure requirements for each equipment listed and the maximum manifold pressure available. Calculations for both primary and secondary systems shall be provided in Appendix A.</p> <p>Example:</p> <p>B.1 CONFIGURATION ONE: PRIMARY: SECONDARY: (A) a. Primary air required = b. Primary air available = c. Secondary air required = d. Secondary air available = e. MMP required = f. MMP available (min and max) =</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM III: DIVERS' AIR SUPPLY SYSTEM			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. For the entire system, provide drawing numbers and latest revisions for the following drawings:</p> <ol style="list-style-type: none"> 1. Schematic (line diagram) drawing including component numbers, relief valve settings, and gauge range. 2. JID (Joint Identification Drawing). 3. Detail fabrication drawing (including Bill of Material, General Notes, Etc.). <p>B. Provide air compressor identification and characteristics within the scope of certification.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM III: DIVERS' AIR SUPPLY SYSTEM --- Continued							
REQUIREMENT	STATUS		RESPONSE*				
	DATE [#]	APVD [#]	SERIAL NO.	RACK/ PRESSURE	SPEC	HYDRO./UT DATE	SYSTEM
<p>D. Provide H.P. Air flasks identification by serial number, size, pressure, and MIL-SPEC (MIL-F-22606, DOT, etc) and date of last Recertification test.</p> <p>NOTE: This section should also include any additional command certified H. P. Air Flasks to be used in conjunction with this system.</p>							

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM III: DIVERS' AIR SUPPLY SYSTEM --- Continued			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>E. Provide compressed air processing equipment identification and characteristics (filters, separators, regulator make, model numbers, etc.).</p> <p>E.1. Last hydrostatic/ultrasonic test dates for:</p> <p>Moisture Separators: (MIL-F-22606) Yes___ No___</p> <p>Filter Housings:</p> <p>Volume Tanks:</p> <p>F. Identify divers' primary and secondary air supply for all configurations and describe procedures for shifting to secondary air supply. (List valve numbers or EPS used to shift.)</p> <p>G. Identify demands placed on compressed air systems other than supplying divers. Will this demand be used during diving operations? If yes, show that demand will not degrade system performance or cleanliness.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM IV: DIVERS' MIXED GAS/OXYGEN SYSTEM

☐ PLACE AN "X" IN BOX IF NOT APPLICABLE

REQUIREMENT	STATUS		RESPONSE *
	DATE [#]	APVD [#]	
<p>A. Provide NAVSEA Drawing numbers of schematic diagram of system(s) that furnish divers' mixed gas/oxygen, showing all storage flasks, controls and processing equipment.</p> <p>B. Provide NAVSEA Drawing number of detailed plans of mixed gas/oxygen system(s) covered in schematic diagram. Identify materials and means of joining.</p> <p>C. Provide mixed gas/oxygen processing equipment identification and characteristics (mixed gas/oxygen transfer pumps, filters, gas mixing console, reducer model numbers, etc.).</p> <p>D. Identify divers' primary mixed gas/oxygen supply and describe procedures for shifting to secondary gas in all phases of the dive.</p> <p>E. Identify demands placed on mixed gas/oxygen systems other than supplying divers.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM IV: DIVERS' MIXED GAS/OXYGEN SYSTEM --- Continued <input type="checkbox"/> PLACE AN "X" IN BOX IF NOT APPLICABLE							
REQUIREMENT	STATUS		RESPONSE*				
	DATE [#]	APVD [#]	SERIAL NO.	RACK/ PRESSURE	SPEC	HYDRO./ UT DATE	SYSTEM
F. Provide mixed gas/oxygen flask identification by serial number, size, pressure, and MIL-SPEC (MIL-F-22606, DOT, etc.), and date last Recertification test.							

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM V: ELECTRICAL SYSTEMS SUPPORTING DIVING OPERATIONS			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. Provide electrical equipment identification and characteristics to include:</p> <ol style="list-style-type: none"> 1. Diver communications 2. Diver handling systems 3. Diver handling systems communications (if applicable) 4. Electrical monitoring systems (O2 monitors, Co2 monitors) <p>B. Provide drawings for all non-ANU equipment.</p> <p>C. Describe all primary and secondary lighting arrangements for night diving operations (include underwater and deck lighting).</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VI: DIVER HANDLING SYSTEM			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. Describe diver handling system.</p> <p>B. Provide equipment identification and characteristics (include type/size of lifting cables).</p> <p>C. Provide working loads.</p> <p>D. Identify emergency diver handling modes.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VII: INSPECTIONS AND TESTS (CURRENT PERIOD)			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. Provide status report of known materials deficiencies or departures for diver equipment and support systems.</p> <p>B. Report date and results of last handling system load and brake inspection.</p> <p>C. Report date and results of last pressure/leak integrity test of air, mixed gas, and oxygen piping systems as required by PMS.</p> <p>D. Provide date and results of latest air purity tests.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VII: INSPECTIONS AND TESTS (CURRENT PERIOD) --- Continued

REQUIREMENT	STATUS		RESPONSE*					
	DATE [#]	APVD [#]	HOSE #	MANUFACTURER MFG	P/N	WORKING PRESSURE	PROOF TEST PRESSURE	BURST PRESSURE
G. Validate hose log covers all permanent and interconnecting hoses and verify that hoses are in accordance with system drawings. At a minimum, hose log should include: hose no., mfg., part no., working pressure and proof test pressure, and date tested.								

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VII: INSPECTIONS AND TESTS (CURRENT PERIOD) --- Continued			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>h. For initial constructed systems or redesigned systems being recertified upon completion of major overhaul:</p> <ol style="list-style-type: none"> 1. Provide results of operational flow tests conducted in accordance with NAVSEA00C3 approved test procedures. <p>I. Provide for all diving umbilicals:</p> <ol style="list-style-type: none"> 1. Military specification or manufacturer and manufacturer's hose ID number. 2. Date of manufacture 3. Length in feet 4. Internal diameter 5. Last hydrostatic test date 6. Hydrostatic test pressure 7. Hydrostatic burst test date and pressure 8. Results of applicable visual inspections and coupling pull tests conducted. <p>NOTE: Hose log shall be available for SCA review during on-site survey.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VIII: OPERATION AND MAINTENANCE PROCEDURES			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>A. Provide operating and emergency procedures for the overall diving system. Indicate that Ops and Eps have been:</p> <ol style="list-style-type: none"> 1. Validated by ship's force 2. Reviewed and approved by NAVSEA #00C3 <p>B. Provide preventive maintenance system (PMS) instructions for overall diving system. Ensure the following system/components are covered by MIPs and MRCs.</p> <ol style="list-style-type: none"> 1. Compressors 2. Flasks 3. Volume Tanks 4. Filters 5. Moisture Separators 6. Diving equipment outfits 7. Diver communications 8. Regulating and reducing valves 9. System gauges 10. System valves 11. Relief valves 12. Diver's breathing gas piping 13. System flexible hoses 14. Diver stage 15. Diver consoles 16. Diver hoses 17. Divers' hot water boiler 18. Diving system electrical interface 19. Strainers 20. Underwater lights 			<p>A.1. Date validated:</p> <p>Validated by:</p> <p>A.2. NAVSEA approval letter serial, date:</p> <p style="text-align: center;"><u>LIST APPLICABLE MAINTENANCE INDEX PAGE NUMBERS</u></p>

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VIII: OPERATION AND MAINTENANCE PROCEDURES --- Continued			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
<p>C. List all PMS related deficiencies and all PMS feedbacks concerning the diving equipment/support systems submitted since last certification.</p> <p>NOTE: These deficiencies will include all MRCs not performed as required or as scheduled.</p> <p>D. List by “Quarter after overhaul number” the PMS Quarterly Schedule, covering all diving systems/equipment, in effect at the time of the on-site survey. During on-site survey provide quarterly schedules for the previous four quarters for SCA review. For systems/equipment not covered by PMS list the command maintenance instruction number and submit the maintenance program to SCA for review.</p>			

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM VIII: OPERATION AND MAINTENANCE PROCEDURES --- Continued					
REQUIREMENT	STATUS		RESPONSE*		
	DATE [#]	APVD [#]	REC NO.	DATE	SHORT TITLE
E. List by number and short title all reentry control (REC) procedures issued since last certification. Provide REC procedures/instructions for review by SCA during on-site survey.					

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM IX: ON-SITE SURVEY (NOTE: Request via Applicant to NAVSEA)					
REQUIREMENT	STATUS				RESPONSE*
	DATE [#]	APVD [#]	SAT	UNSAT	
<p>NOTE: This item is performed by the System Certification Authority.</p> <p>A. Inspection of material condition of diver equipment and support systems.</p> <p>B. Verification of accessibility to vital equipment. 1. Vital valves, components, and gauges 2. Communications equipment 3. Electrical power</p> <p>C. Verification of conformance to “as built” drawings.</p> <p>D. Review the hose log.</p> <p>E. Review of Re-entry Control records.</p> <p>F. For initial construction of refurbished systems, review of test plans, procedures/records for fabrication, construction, and assembly.</p>					

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM IX: ON-SITE SURVEY --- Continued					
REQUIREMENT	STATUS				RESPONSE*
	DATE [#]	APVD [#]	SAT	UNSAT	
G. Review of proof and performance test procedures/records (i.e., leak tests, hydrostatic tests, operational tests, etc.).					
H. Review of system cleaning procedures and records.					
I. Review of current system air sample results.					
J. System certification guidelines/requirement checklist completed.					

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM X: OPERATIONAL DEMONSTRATION (FOR SCA USE ONLY)			
REQUIREMENT	STATUS		RESPONSE*
	DATE [#]	APVD [#]	
A. Date of operational demonstration			
B. Type of diving equipment used			
C. Names of diving officer, diving supervisor, and divers (including level of qualification)			
D. Maximum depth achieved 1. Air dive 2. Mixed gas (if applicable)			
E. How was depth verified?			
F. Total bottom time.			
G. Manifold pressure 1. minimum 2. maximum			
H. Weather/sea state			
I. Type of moor			
J. General comments			

This diving system has been found to be operationally functional and post-dive inspection verifies that no condition exists or has developed as a result of operational demonstration which could be dangerous or impair the satisfactory operation of this system.

Signature and date

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

APPENDIX A: SUPPORTING AIR/OXYGEN/MIXED GAS CALCULATIONS
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For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ITEM : CONTINUATION SHEET

For SCA use only: date and initial

* Should response exceed space provided, use continuation sheet.

ENCLOSURE (3)

SYSTEM CERTIFICATION SURVEY CHECKLIST

SURVEY

SYSTEM CERTIFICATION REQUIREMENTS/GUIDELINES FOR AFLOAT AND PORTABLE RECOMPRESSION CHAMBERS AND SURFACE SUPPORTED DIVING SYSTEMS

SYSTEM _____ SURVEYOR _____

SECTION I - GENERAL	DATE: / /	YES	NO
1. Has the PSOB for Standard U.S. Navy Surface Supported Diving Systems been submitted to and approved by NAVSEA 00C <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 2 Para. 2-2.3)</i>			
2. Has the PSOB for Standard U.S. Navy Recompression Chamber Systems been submitted to and approved by NAVSEA 00C? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 2 Para. 2-2.3)</i>			
3. Are the primary and secondary air/gas systems clearly defined in the PSOB? <i>(USNDM Vol. 2, Chpt. 8, Para. 8-6.2)</i>			
4. Are the drawings for all equipment within the Scope of Certification up to date reflecting the current "as-built" configuration? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 2 Para. 2-2.3 & Chpt. 3 Para. 3-2.7)</i>			
5. Do systems drawings identify all functional components by type, material, part or piece number, etc. and are designation numbers for components shown on the diagramatic/schematic drawings? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-2.7)</i>			
6. Do adequate Operating Procedures (OP's) and Emergency Procedures (EP's) exist for system line up and operation and are they approved in writing by NAVSEA 00C3? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-6 & USNDM Vol. 2, Chpt. 8, Para 8-6.2.1)</i>			
7. Do the OP's state the maximum and minimum operating pressures for the HP flasks? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para B-13.1.3 & USNDM Vol. 2, Chpt. 22, Para 8-6.2)</i>			
8. Does the Scope of Certification adequately define the boundaries and differentiate between in-scope and out-of-scope equipment? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 2 Para. 2-2.1)</i>			
9. Have Re-Entry Control Procedures (REC) been officially established in writing? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-4.4 & App. I)</i>			
10. Is REC procedure being followed and a log kept? <i>(USNCERTMAN SS521-AA-MAN-010 App. I Para. I-5.2)</i>			
11. Are the air/gas systems and recompression chamber adequately covered by PMS? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-2.8.4, 3-8)</i>			
12. Are air samples taken every six months and are the sample reports available for review? <i>(USNDM Vol. 2, Chpt. 8, Para. 8-6.1.1).</i>			

SECTION I - GENERAL	DATE: / /	YES	NO
<p>13. Is documentation available verifying that all divers' breathing gas meets the required purity standards?</p> <p><i>(USNDM Vol. 2, Chpt. 8, Para. 8-6.1.1).</i></p>			
<p>14. In installations where diving air systems receive air from or provide air for non-diving functions, are priorities established in writing assuring adequate air is available for diving and/or recompression chamber operation?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1)</i></p>			
<p>15. Are flexible hoses used for oxygen service of an approved type? (Teflon Lined)?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.3)</i></p>			
<p>16. Do temporary installed flexible hose assemblies meet the requirements of S6430-AE-TED-010 Vol. 1 TECHNICAL DIRECTIVE FOR PIPING DEVICES, FLEXIBLE HOSE ASSEMBLIES?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.3)</i></p>			
<p>17. Hoses and connectors used in application where they may be subject to mechanical loading, or if they were to fail and rupture, (and cause physical harm), are they provided with strain relief?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.3)</i></p>			
<p>18. Is air compressor suction located so as to avoid contamination or exhaust fumes?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.1.a & USNDM Vol. 2, Chpt. 22, Para. 8-6.1.1)</i></p>			
<p>19. Is there a filter installed in the compressor air intake either at the weather deck end or prior to the line entering the compressor?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.1.a & NSTM Chpt. 551 Para. 1.3.1 & 1.3.2)</i></p>			
<p>20. Is MIL-L-17331, 2190 TEP (normal operation), MIL-L-17672, 2135 TH (cold weather), or a NAVSEA approved lubricating oil being used in the compressors?</p> <p><i>(USNDM Vol. 2, Chpt. 8, Para. 8-6.2.2.4)</i></p>			
<p>21. Is there a back pressure regulator installed between the compressor outlet and the accumulator for compressors with a discharge pressure over 1000 PSIG?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.1.1.e & USNDM Vol. 2, Chpt. 8, Para. 8-6.2.2.8)</i></p>			
<p>22. Do low/medium pressure compressors operate in a discharge pressure range that is within 15 percent of maximum rated output pressure?</p> <p><i>(NSI Engineering Study "Use of Back Pressure Regulators in DLSS")</i></p>			
<p>23. Are installed moisture separators within PMS hydrostatic test requirements?</p> <p><i>(NSTM Chpt. 551 Para. 1.14.1.1.a & PMS MIP 5921/34)</i></p>			
<p>24. Are installed filter housings within PMS hydrostatic test requirements?</p> <p><i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.5 & PMS MIP 5921/34)</i></p>			

SECTION I - GENERAL	DATE: / /	YES	NO
25. Are all permanently installed air/gas flasks within PMS recertification test requirements as defined by NAVSHIPS TECH MANUAL? <i>(NSTM Chpt. 551 Para. 1.14.1.1.b thru d & Chpt. 550 Para. 2.40 & 7.187 & PMS MIP 5921/34)</i>			
26. The method of recertifying MIL-F-22606 flasks is by using UT inspection. The UT procedure is defined in SEA 03ME PROCEDURE UTFIP-1 of 2 December 1994 . A separate flask inspection report shall be prepared in accordance with MIL-STD-271 for each flask inspected. The following information as a minimum shall be included in the report:			
a. Is there a separate report for each flask tested?			
b. Are flasks identified by size and type?			
c. Is the magnetic particle and ultrasonic procedure(s) identified by revision number?			
d. Are the inspector's qualifications current?			
e. Is the date of each inspection recorded?			
f. Is the type of material recorded?			
g. Is the equipment used described by serial numbers (ultrasonic instruments and magnetic particle equipment)?			
h. Is the Ultrasonic transducer manufacturer, frequency, size, angle, and serial number recorded?			
I. Was the correct ultrasonic couplant used?			
j. Are the ultrasonic calibration standard serial numbers recorded?			
k. Is the paint condition and the specific technique used to compensate for paint (thickness measurement and shear wave inspections) described?			
l. Is a unique number assigned to each reportable discontinuity?			
m. Are the specific locations of each discontinuity on the flask reported? (Reporting shall be such that the area can be relocated after the flask is painted).			
n. Is the length of each discontinuity, and the method used to measure the length recorded?			
o. Is the orientation of the discontinuity (eg. relative to the flask axis or weld direction) recorded?			
p. Is the ultrasonic peak amplitude in dB, relative to reference level recorded?			
q. Is the location of the discontinuity from the scanning surface recorded?			
r. Is the characterization of the discontinuity recorded?			

SECTION I - GENERAL	DATE: / /	YES	NO
s. Did the flask pass? <i>(SEA 03ME Procedure UTFIP-1 & MIL-STD-271)</i>			
27. Are all Department of Transportation (DOT) type cylinders within the DOT hydrostatic test date requirements? <i>(Code of Federal Regulations Chpt. 1 Vol. 49 Sect. 173.34)</i>			
28. Are composite flasks free of structural damage? <i>(SS500-HK-MMO-010/LWDS Table 8-1)</i>			
29. Are composite flasks being drained according to PMS and post diving procedures? <i>(Diving System Operating Procedures)</i>			
30. Are HP air/gas flasks stowed so there is easy access for inspection and bleed off of accumulated moisture? On horizontal flasks check arrow to make sure it is pointed down. <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.1.d & ASTM Chpt</i>			
31. Are air/gas receivers (LP, MP volume tanks) and pressure vessels designed in compliance with Mil-Specs, ASME standards or other recognized specifications? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-4)</i>			
32. Have air/gas receivers (LP, MP volume tanks) been given a hydrostatic test to one and one-half times the working pressure IAW PMS? <i>(NSTM Chpt. 551 Para. 1.5.5 & NAVSEA Code 56Y23)</i>			
33. Is there relief valve protection downstream from all pressure reducing stations? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.c)</i>			
34. Is the relief valve set at 110 % of maximum working pressure and tagged with the pressure setting, date set and testing activity? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Paras. B-9.7 & B-13.1.4.d & NSTM Chpt</i>			
35. Are relief valves (except chamber relief valves) installed so they cannot be isolated from the system they are protecting? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.d)</i>			
36. Are all critical installed system gages within calibration? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.2)</i>			
37. Are all gages labeled, adequately supported, provided with isolation valves and mounted to allow for "blowout plug" operation? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.2 & USNDM Vol</i>			
38. Are valves, check valves, moisture separators, filters and regulators installed so that gas flow is in the direction of the flow arrows or inlet and outlet legends marked on the device? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.g)</i>			
39. Are all valves and functional components identified with a label plate bearing the system designation number as it appears on the drawing? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9 & NSTM Chpt. 505)</i>			

SECTION I - GENERAL	DATE: / /	YES	NO
40. Are all valve handwheels color coded? Where (multiple service)? (NSTM Chpt. 505 & USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9)			
41. Are all valves and controls readily accessible? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-11)			
42. Are all lines and piping runs labeled, color coded (where multiple service), and provided with flow direction arrows? (NSTM Chpt. 505 & USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9)			
43. Are lines adequately supported with pipe clamps/brackets and are they protected from external forces when in an exposed location? (USNCERTMAN SS-521-AA-MAN-010 App. B Para. B-9)			
44. Are reducing stations provided with an emergency bypass or is there a second reducer installed in the system? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.b)			
45. Are there dust caps/bags on charging connections, manifold outlets, interface hose connections, and divers umbilical hoses when not in use? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9-3)			
46. Are all components (filters, air receivers, flasks, moisture separators, moisture traps, divers air manifold, etc.) that trap condensed water or oil mist provided with drain valves? (NSTM Chpt. 551, Para 1.12.3.2)			
47. On a system without its own air compressor, is there a moisture separator, filter and relief valve installed at the charging connection? or is it covered by OPS? (NSTM Chpt. 551, Para. 1.15.2)			
48. For 5000 PSI compressors used for charging 3000 PSI systems: Are relief valves in place to prevent over pressurization? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.d)			
49. Are there provisions for lighting of diving control stations for night operations? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-10.8)			
50. Are 5000 PSI compressor connections different than commands 3000 PSI systems? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9)			

SECTION II - SURFACE SUPPORTED DIVING SYSTEMS (AIR/MIXED GAS) DATE: / /	YES	NO
1. Is the primary air/gas system capable of supporting the maximum number of divers (both pressure & flow) during the most imposing dive specified in the PSOB? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.1, USNDM Vol. 2, Chpt. 22, Para. 8-6.2)</i>		
2. Is the secondary air/gas system capable of supporting the maximum number of divers (both pressure & flow) on an ascent from the most imposing dive specified in the PSOB if the primary system fails at the "worst case" time? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.2, USNDM Vol. 2, Chpt. 22, Para. 8-6.2)</i>		
3. Is a Diver's Umbilical Hose Record Log maintained? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.3)</i>		
4. Are all air/gas systems filtered before reaching the diver? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.1.f & USNDM Vol. 2, Chpt. 22, Para 8-6.1)</i>		
5. Does the diving air/gas manifold have a pressure gage and gage isolation valve? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.2.b)</i>		

SECTION III - RECOMPRESSION CHAMBER	DATE: / /	YES	NO
<p align="center">NOTE</p> <p><u>When conducting a survey of a recompression chamber that does not operate in conjunction with a surface supported diving system (i.e. Submarine Tender, ASDV'S Mobile Chambers, etc.) the appropriate portions of SECTIONS II and IV should be completed for the recompression chamber support systems.</u></p>			
<p>1. Do calculations confirm that primary air system has sufficient air. (USNDM Vol. 2, Chpt. 22, Para. 4).</p>			
<p>2. Do calculations confirm secondary air system has sufficient air. (USNDM Vol. 2, Para. 4)</p>			
<p>3. Has interior of chamber been painted since last survey?</p> <p>a. If chamber has been painted was a NAVSEA approved painting procedure used? (USNDM Vol 2, Chpt. 22, Para. 6-2.4)</p>			
<p>4. Has an air sample been taken from the chamber interior to ensure that no undesirable off gassing or contamination has occurred? (Accomplished on steel chambers after any interior painting has been done, and on all chambers after overhaul or rework. Sample should also be taken if contamination is suspected.) (USNCERTMAN SS521-AA-MAN-010 App. F Para. F-1) If painted, use NAVSEA-OOC3-P1-001 paint instruction for sample - if not painted, use regular sample. (USNDM Vol 2, Chpt. 22, Para. 6-2.4) (NAVSEA-00C3-P1-001) on request.</p>			
<p>5. Has chamber been pressure tested within the last two years? (USNDM Vol 2, Chpt. 22, Para. 6-2).</p>			
<p>6. Is the material in the oxygen system, including valves, piping, fittings, gages, hoses, lubricants and software of approved material? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.e & MIL-STD-777 Para. 1-1)</p>			
<p>7. Are sufficient oxygen cylinders on station and can cylinders be readily connected and removed from the system while oxygen is in use? (USNDM Vol 2, Chpt. 22, Para. 2-5)</p>			
<p>8. Does each installed BIBS mask have an isolation valve or quick disconnect? (Chamber Design Drawings)</p>			
<p>9. Are chamber BIBS masks operating properly with adequate flow rates and no leaks? (USNCERTMAN SS521-AA-MAN-010 Para. 3-2.4 and B-9.4 & SS500-AW-MMM-010 Chpt. 3 Para. 3-3.2)</p>			
<p>10. Are chamber relief valves set at 110 psi and tagged with pressure setting, date set and testing activity? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.7 & B-13.1.4.d & NSTM Chpt. USNDM Vol. 2, Chpt. 22, Para. 2.5.4)</p>			

SECTION III - RECOMPRESSION CHAMBER	DATE: / /	YES	NO
11. Are ball-type gag valves installed between the chamber and chamber relief valve? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-13.1.4.d, & USNDM Vol. 2, Chpt. 22, Para. 2-5.4)</i>			
12. Are these valves lock-wired in the open position with light (frangible) wire? <i>(USNDM Vol. 2, Chpt. 22, Para. 2-5.4)</i>			
13. Is the relief valve gag valve warning plate affixed to the valve or to the chamber in the vicinity of the inner/outer lock relief valves? <i>(USNDM Vol 2, Chpt. 22, Para. 5-3.4))</i>			
14. Are all valves, including exterior oxygen control valves for the inner and outer locks readily accessible? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-11)</i>			
15. Are viewports free of chips, cracks, discoloration, crazing, or other defects? TRCS NOTE: It is imperative that the inside viewport cover is free of chips, cracks and discoloration as it acts as a secondary seal for the viewport. Do not remove inside viewport cover unless replacement is necessary. <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-6.3, USNDM Vol 2, Chpt. 22, Para. 12a & SS500-AW-MMM-010 Chpt. 3 Para. 3-3.1)</i>			
16. Are acrylic viewports less than 10 years old? Age is determined from date of fabrication. Are the following forms available for new viewports? a. Form PVHO-2 Fabrication Certification for Acrylic Windows b. Appendix A Enclosure 2 Material Manufacturer's Certification for Acrylic c. Appendix A Enclosure 3 Material Testing Certification for Acrylic d. Appendix A Enclosure 4 Pressure Testing Certification <i>(PVHO 1 App. A Pg. 25 & USNCERTMAN SS521-AA-MAN-010 App. B Para. B-6.3)</i>			
17. Are all door dogs, or other type installed door securing devices, in good condition and functioning properly? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-6.4, USNDM Vol 2, Chpt. 22, Para. 11a & SS500-AW-MMM-010 Chpt. 3 Para. 3-3.1)</i>			
18. Are inner and outer lock door gaskets free of cracks, deterioration and excessive adhesive on gasket butt joint? <i>(USNDM Vol 2, Chpt. 22, Para. 11a.)</i>			
19. Does the medical lock, if installed, operate properly? Does exhaust valve handle cover the medical lock latch when in the closed position on TRC? <i>(USNDM Vol & SS500-AW-MMM-010 Chpt. 3 Para. 3-3.1 & IAW OP-3)</i>			
20. Is interior wiring properly supported and adequately protected so that it cannot be damaged or used for hand-holds? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-10.2)</i>			

SECTION III - RECOMPRESSION CHAMBER	DATE: / /	YES	NO
21. Are interior lamps provided with 40 watt bulbs to prevent overheating? (USNDM)			
22. Is emergency lighting available for operators and to illuminate inside the chamber? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-10.8 & USNDM Vol. 2, Chpt. 22, Para. 2-5)			
23. Do primary (open speaker/headsets) and secondary communications systems in both the inner and outer locks work properly? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-10.10 & USNDM Vol. 2, Chpt. 22, Para. 2-5)			
24. Are mattress and bedding of approved fire resistant material, and are unauthorized flammable materials excluded? (USNDM Vol 2, Chpt. 22, Para. 6-2.6)			
25. Is the "Fire/Explosion Hazard" warning sign posted at or in very close proximity to the chamber entrance door? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-15.b & USNDM Vol. 2, Chpt. 22, Para. 6-2.6)			
26. Are aural protectors present in the chamber and do they have equalization holes drilled in each ear piece? (USNDM Vol. 2, Chpt. 22, Para. 11b)			
27. Is there an approved means of extinguishing a fire in the interior of the chamber? (Code of Federal Regulation (CFR) 197.328(13) (USNDM Vol. 2, Chpt. 22, Para. 6-2.6)			
28. Are chamber bilges and medical lock clean and dry? (USNDM Vol 2., Chpt. 22, Para. 12a)			
29. Are drain plugs, if installed, free from signs of significant corrosion? (USNDM Vol 2., Chpt. 22, Para. 6-2.2)			
30. Are all penetrators free of corrosion? (USNDM Vol. 2, Chpt. 22, Para. 6-2.2)			
31. Are deck plates properly secured? (PMS MIP'S H-12/98-81, H-12/88-27 & USNDM Vol. 2, Chpt. 22, Para. 12a)			
32. Are the exhaust ports guarded to prevent injury on decompression or venting and are they free from sharp edges and burrs? (USNDM Vol 2, Chpt.22, Para. 2-5.2)			
33. In chambers with the modernization alteration installed do the following listed components operate properly:			
a. heater/chiller unit?			
b. carbon dioxide scrubber?			
c. oxygen analyzer?			
d. carbon dioxide analyzer?			
e. thermometer?			

SECTION III - RECOMPRESSION CHAMBER	DATE: / /	YES	NO
f. Cauty light intensity controls?			
g. GFI			
(AIG 91-12)			
34. Conduct unmanned run to 165' Inner Lock (primary air)			
a. Verify 80fpm travel rate to 40fsw (only for chambers authorized to conduct SUR D's) Time to 40' _____			
b. Verify 20fpm travel rate or greater to 165 Time to 165' _____			
c. Check for leaks at 165'. ie, doors, ports			
d. Press Outer Lock to 165' (secondary air)			
e. Check for leaks			
f. Compare depth gages			
g. Surface system (check flow fuses if installed)			
h. At what depth does seal break for OL door. _____			
35. Manned run to 60'.			
NOTE: A MINIMUM OF TWO PERSONELL WILL MAN THE CHAMBER FOR THE MANNED RUN.			
a. Run chamber to 60' two men.			
b. Compare all depth gages.			
c. Breath all BIBS primary and secondary (adjust regulators as required) Breath BIBS at 60' and 30'.			
NOTE: ONLY ONE MAN SHALL BREATH OXYGEN AT A TIME			
d. Does IL/OL door operate properly?			
e. Operate medical lock, does medical lock operate properly?.			
f. Test Primary and Secondary air Regulators, do regulators operate properly?			
g. . Shift between Primary and Secondary air supplies. Are air supplies operating properly?			
h. Check OL hatch for leaks.			
i. Operate heater and chiller (where installed)			

SECTION III - RECOMPRESSION CHAMBER		DATE: / /	YES	NO
j. Check O2 and C02 monitor (where installed)				
k. Operate all comms.				
l. Operate scrubber (where installed).				
m. Test emergency lighting.				
n. Surface chamber.				

SECTION III A – TRANSPORTABLE RECOMPRESSION CHAMBER SYSTEM DATE: / /	YES	NO
<p align="center">NOTE:</p> <p>Remove TRC and TL control panels prior to completing the following inspections.</p>		
1. Are NATO flanges (male and female) free of nicks, gouges and burrs? <i>(SS500-AW-MMM-010 Chpt. 3 Para. 3-3.1)</i>		
2. Are flange bolt lock wires in place and properly secured? <i>(SS500-AW-MMM-010 Chpt. 3 Para. 3-3.1)</i>		
3. Check material condition of TRCS equipment <ul style="list-style-type: none"> a. Are flange bolt lock wires in place and properly secured? b. Is rubber lip seal clean and free of cuts? c. Are lifting lugs, lifting handles, shell and skid assembly free of distortion, dents, gouges and visible damage? <i>(TRCS TECHMAN NAVY SS500-AW-MMM-010)</i>		
4. Review PMS for validity and completeness of items unique to the TRCS as follows: <ul style="list-style-type: none"> a. Medical lock? b. NATO lip seal? c. TRC supply and exhaust system? d. TL supply and exhaust system? e. NATO flange bearings? f. Verify OP 1 and OP 2 have been satisfactorily completed 		
5. Conduct unmanned run to 165' (mated for entire TRCS) Verify 80 fpm travel rate to 40' and then 20 fpm travel rate to 165', (80fpm travel rate to 40fsw only for chambers authorized to conduct SUR-D's) Time to 40fpm_____ Time to 165fpm_____ <ul style="list-style-type: none"> a. Check for leaks at 165', i.e. mating flanges, ports, doors? b. Compare depth gages. c. Surface system; do exhaust flow fuses operate properly? d. Check poppet valve and mating flange for leaks at 5'. 		
e. Conduct unmanned runs for additional TL's as requested in PSOB TL#_____ <div style="text-align: right;">TL#_____</div> <div style="text-align: right;">TL#_____</div>		

SECTION III A – TRANSPORTABLE RECOMPRESSION CHAMBER SYSTEM DATE: / /	YES	NO
f. At what depth does seal break for TRC_____/TL_____/FSW_____ <i>(TRCS TECHMAN NAVY SS500-AW-MMM-010)</i>		
6. Manned run to 60' (to include TL if applicable) Note: If TRC is used alone 2 men will man the chamber. a. Check scrubber for proper operation b. Run TRC unmated to 60' 2 men c. Run TL unmated to 60' unmanned. d. Mate TRC to TL e. Does mating clamp operate properly? f. Observe mating operation. g. Breath all BIBS primary and secondary (Adjust regulator as necessary) <div style="text-align: center;">NOTE: ONLY ONE MAN SHALL BREATH OXYGEN AT A TIME</div> <i>(TRCS TECHMAN NAVY SS500-AW-MMM-010)</i>		
7. Do inner and outer lock doors operate easily and seal properly? a. At what depth does the seal break for TRC_____/TL_____/FSW? b. Operate medical lock, does medical lock operate properly? c. Test primary and secondary air regulators; Do air regulators operate properly? d. Check O2 and CO2 monitor (where installed) e. Operate all comms. f. Operate scrubber (where installed). g. Test emergency lighting. h. Surface chamber.		

SECTION IV - SYSTEM FABRICATION	DATE: / /	YES	NO
1. Are the components used in the system such as air compressors, filters, chamber gages, etc. on approved products list, or is documented approval from NAVSEA 00C for their use available? (USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.1 & NAVSEAINST 10560.2)			
2. Are the piping, fittings, valves, unions and gaskets used in the fabrication of the compressed gas systems IAW the following tables from MIL-STD-777:			
a. Table J for Air Systems?			
b. Table K for oxygen and Mixed Gas Systems?			
c. Or are NAVSEA approved? (MIL-STD-777 Para. 1.1)			
3. Was the system brazed to the requirements of NAVSEA 0900-LP-001-7000, Class P3A Special Category, or similar commercial specification approved by NAVSEA? (USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.2)			
4. Are records available showing brazer was qualified at the time the system was fabricated? (USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.2)			
5. Are records available showing that all brazing was done IAW qualified and approved brazing procedures: (USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.2)			
6. Are there visible indications (scribe marks one-inch or a pre-determined distance from joint) indicating proper fit-up of joint before brazing? (NAVSEA 0900-LP-001-7000 Para 5.5.6.3)			
7. Was welding done IAW MIL-STD-278, Class P-1, or a similar commercial specification approved by an equivalent welding authority? (USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.1 & Para 3.3.2(b)(1))			
8. Are records available showing welder and NDT inspector were qualified at the time the system was fabricated? (USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.1)			
9. Are the following class P1 records available for all welded joints:			
a. Joint identification?			
b. Joint design?			
c. Base material type? (include heat/lot identification)			
d. Filler material type? (include heat/lot identification)			
e. Fit-up?			

SECTION IV - SYSTEM FABRICATION	DATE: / /	YES	NO
f. Welding procedure identification? g. Heat treatment? h. Welder identification: i. NDT methods and results? j. Disposition of weld? k. Cycles of repairs to welds? l. Inspection procedure? m. NDT personnel identification?			
10. Was oxygen system fabricated IAW approved procedures? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.1 & MIL-, Para 3.3.2(b)(1))</i>			
11. Is documentation available, dated and signed showing that the installed system has successfully completed a hydrostatic test of 1.5 times the maximum design working pressure? <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.5 & NSTM Chpt. 551, Para 1.16.1.1.1)</i>			
12. Confirm that any <u>new components</u> i.e. valves, reducers, pressure regulators, relief valves, etc., have been tested to 1.5 max system operating pressure. <i>(USNCERTMAN SS521-AA-MAN-010 App. B Para. B-9.5 & NSTM Chpt. 551, Para 1.16.1.1.1)</i>			
13. Have new/refurbished valves been seat tightness tested? <i>(MIL-STD-1330D, Table VII)</i>			
14. Has system tightness/drop test which conforms to the following parameters been conducted: a. New construction (drop test required); 1. Air systems pressurized above 1000 psig, 24 hours, 1% drop? 2. Air systems pressurized below 1000 psig, 6 hours, 5% drop? 3. Helium/helium oxygen systems, 24 hours, 1% drop? 4. Oxygen systems, 24 hours, 1% drop? b. Modified, refurbished, overhauled (drop test required); 1. Air systems pressurized above 1000 psig, 24 hours, 1% drop? 2. Air systems pressurized below 1000 psig, 6 hours, 5% drop? 3. Helium/helium oxygen systems, 24 hours, 1% drop? 4. Oxygen systems, 24 hours, 1% drop?			
	c. Joint tightness test where all disturbed joints are accessible for soap testing and visual inspection;		

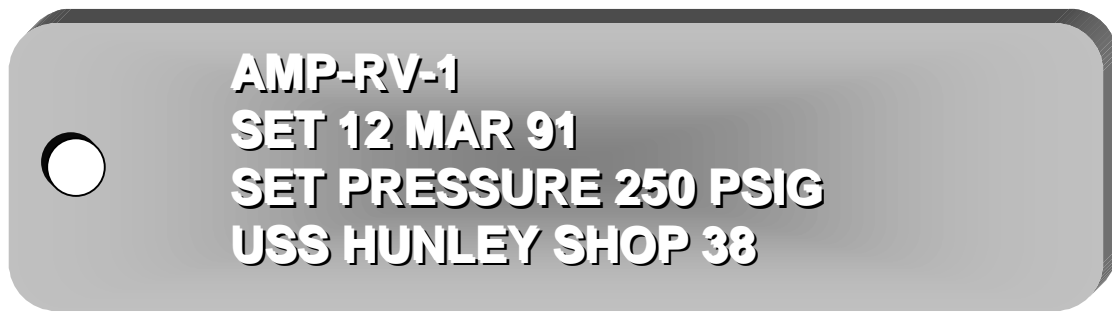
SECTION IV - SYSTEM FABRICATION	DATE: / /	YES	NO
1. Air/oxygen, 0 leakage?			
2. Helium/helium oxygen, 0.6 cc/min? (Leakage is identified by the formation of individual bubbles under white light inspection) <i>(MIL-STD-1330D, Table VIII)</i>			
15. Has system been cleaned and inspected for hydrocarbon removal and particulate level IAW a NAVSEA approved procedure? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-3.3)</i>			
16. Has the system been checked for cleaning agent removal IAW a NAVSEA approved procedure? <i>(USNCERTMAN SS521-AA-MAN-010 App. G3 Para. 5-2 &G-5.3)</i>			
17. Has the system been flow tested IAW a NAVSEA approved procedure? <i>(USNCERTMAN SS521-AA-MAN-010 Chpt. 3 Para. 3-5.3)</i>			

SECTION V - DIVER'S HANDLING SYSTEMS	DATE: / /	YES	NO
1. Has the diver's handling system, as defined in the PSOB, been weight tested? <i>(USNCERTMAN SS521-AA-MAN-010 App. H Para. H-3.3.5, General Specifications for Overhaul of Surface Ships Sect. 092 Para. 092F, Sect. 582 Para. 582j & PMS MIP H-12/25)</i>			
2. Are Test Label Plates attached showing all required test data? <i>(General Specifications for Overhaul of Surface Ships Sect. 573 Para. 573h)</i>			
3. Are lines/wire rope used to deploy the diver's stage the proper size (diameter) and material? <i>(NSTM Chpt. 613)</i>			
4. Has the diver's stage been weight tested IAW PMS? <i>(USNCERTMAN SS521-AA-MAN-010 App. H Para. H-3.3.5)</i>			

SECTION VI - MISCELLANEOUS QUESTIONS	DATE: / /
<p>Have you been getting Top Side Tech Notes? (If you have, what would you like to see in future issues?)</p>	
<p>What do you like least about Certification? What changes would you like to see?</p>	
<p>What can we do at NAVSEA to help make things better?</p>	
<p>Is the Navy supplying the right kind of equipment (i.e., diving rigs, HP compressors, helmets, hoses, HP systems)? If not, what would you like to see?</p>	

ENCLOSURE (4)

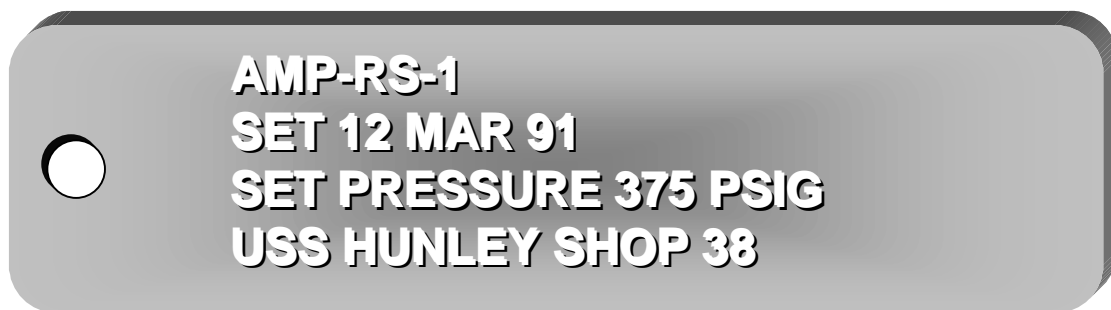
TYPICAL METAL TEST TAGS



TYPICAL RELIEF VALVE



TYPICAL INTERFACE HOSE TAG



TYPICAL MOISTURE SEPARATOR TAG

TYPICAL METAL TEST TAGS
WITH STAMPED CHARACTERS